

CONCORD

Climate **C**hange - **O**rganizing the **Sci**ences for the American **COR**dillera
Cambio **C**limático - **O**rganizando la **Cie**ncia para la **COR**dillera Americana

RESÚMENES

Simposio sobre Cambio Climático:

Organizando la Ciencia para la Cordillera Americana

Incluyendo Resúmenes de IAI-CRNII-047 y UNESCO-IHP

Symposium on Climate Change:

Organizing the Science in the American Cordillera

ABSTRACTS

Including IAI-CRNII-047 and UNESCO-IHP Abstracts

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Tree-ring based reconstructions of streamflow: Research to applications

Connie A. Woodhouse

National Climatic Data Center, Paleoclimatology Branch, Boulder, CO, USA

Water resource planning and management are typically based on the hydroclimatic conditions that have occurred over the 20th century. Paleoclimatic data often indicate that this period contains just a subset of the conditions that have occurred over longer periods of time. Thus, it may be useful to consider the information contained in paleoclimatic records in water resource planning, particularly with regard to drought. However, there are barriers to the application of this information to water resource management that range from a lack of awareness of the information paleoclimatic data can provide, and a lack perceived need for this type of planning, to no knowledge of how to apply this information to planning and management. A lack of appropriate paleoclimatic data often underlies all of these.

Severe drought conditions in the western U.S. in 2002 provided a “window of opportunity” to work with water managers to incorporate tree-ring based reconstructions of streamflow into water resource planning. The onset of this drought coincided with the funding of a research project to develop reconstructions of streamflow for Colorado River basins and ongoing tree-ring chronology development in the region. Preliminary reconstructions were available soon after the devastatingly dry spring of 2002, when water managers began to ask, how often in the past has runoff been this low? This provided the opening to begin working collaboratively with several Colorado water management agencies. One of the partnerships we developed was with Denver Water, the largest water provider in the State of Colorado. Our three-year collaboration has resulted in Denver Water engineers using streamflow reconstructions as input into their water system model to assess the system’s reliability under a range of drought conditions more severe than the 19050s, which had been the basis for drought planning. Other partners have used the streamflow reconstructions to test the results of decision-making, or to get a qualitative sense of the range of hydroclimatic conditions that have occurred in the past.

This effort was broadened to the entire Colorado River basin in the spring of 2005 at a workshop that was designed to learn about resource management and decision-making needs in the Colorado River basin, and explore ideas for how tree-ring reconstructions could be used for decision support. Participation was evenly split between the water management and scientific communities. Feedback from water managers indicated that the opportunity to work directly with scientists was very helpful to understand critical issues related to the use of paleodata and hydrologic information in water resource management, and feedback from scientists indicated that understanding management constraints and requirements was likewise extremely useful. Several recommendations from this workshop; regional technical workshops, a web-based tree-ring streamflow reconstruction resource, and a guidebook for water managers are currently being pursued. We are currently beginning to devise a framework, based on the work in Colorado and the workshop recommendations, to support paleohydrologic efforts over larger geographic areas and for a range of water resource management needs.